

MALE AND FEMALE GAMETOPHYTES IN BEGONIA DICHROA

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The genus Begonia, a member of Begoniaceae, is widely cultivated throughout the globe for its colourful foliage and flowers. Although the genus comprises 900 species,¹ very little work has been done on its embryology.¹⁻¹⁰ The present report deals with the male and female gametophytes in Begonia dichroa Sprague.

The anther is tetrasporangiate. Its wall consists of the epidermis, endothecium, two middle layers and secretory tapetum. The endothecium later on develops the fibrous thickenings. The pollen mother cells undergo simultaneous cytokinesis and produce decussate, isobilateral and tetrahedral tetrads. However, the last type being more frequent. Young pollen grains are round or slightly oval. At maturity the pollen grains become oblong or ellipsoidal. The mature pollen grains are two celled, tricolporate with a smooth exine and a thin intine. Degeneration of anther and pollen at different stages of development is quite common.

The winged inferior ovary is tricarpeal syncarpous and trilocular with many distinct short styles. The projecting axile placentae are bifurcated. The ovule is anatropous, bitegmic and weakly crassinucellate. The inner integument is 2-layered and the outer integument is 2 or 3-layered. The cells of the inner integument elongate radially, accumulate abundant cytoplasm and differentiate into an endothelium. The micropyle is formed by both the integuments. A well developed hypostase is also formed.

The single celled hypodermal archesporium cuts off a parietal cell towards outside and a megaspore mother cell towards inside. The parietal cell by further anti and periclinal divisions produces two parietal layers. The megaspore mother cell undergoes meiosis and produces either linear or T-shaped megaspore tetrads. The chalazal megaspore of the tetrad develops into 8-nucleate embryo sac of the polygonum type. The synergids are pear-shaped. The uninucleate antipodals are three in number and are ephemeral.

The micro and megasporogenesis are identical in all the members of the family hitherto investigated.¹⁻¹⁰ However, bitegmic and tenuinucellate ovules are reported

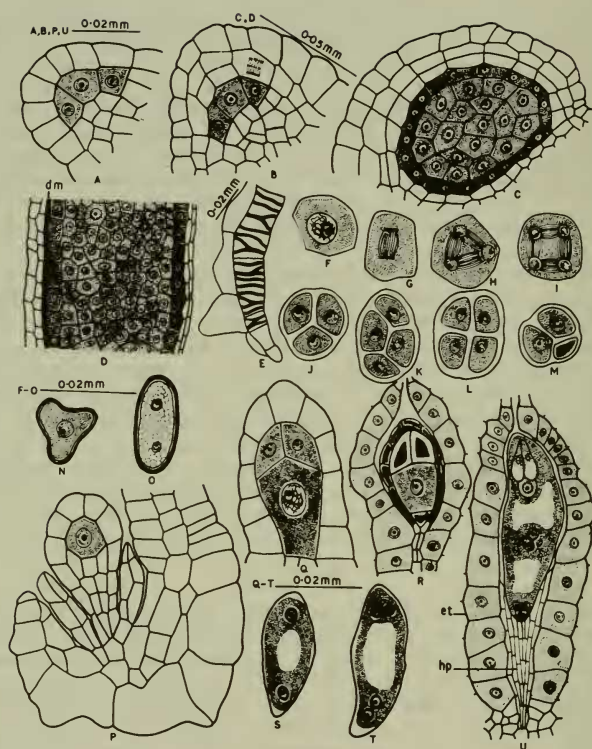


FIGURE 1

FIG. 1

A-D, Part of anther lobes showing development of anther wall and sporogenous tissue; E, Fibrous endothecium; F-I, Pollen mother cells in meiotic division; J-M, Pollen tetrads; N&O, Pollen grains; P-U, Stages in megasporogenesis and female gametophyte. (dm, degenerating middle layer; et, endothelium; hp, hypostase).

in a few species of Begonia⁸⁻¹⁰. In B. dichroa the nucellus degenerates soon and the embryo sac directly comes in contact with the inner layer of the inner integument which differentiates into an endothelium as in B. crenata,¹⁰ B. anamalayana and B. malabarica.⁵ However, in a few species of Begonia the outer most layer of the nucellus develops into the epithelium.⁸ But, Swamy and Parameswaran (1960) and Maheswari Devi and K.C. Naidu (1979) observed a perfectly well developed integumentary tapetum in all the species of Begonia investigated by them. Therefore, the epithelium of Sandt (1921) also may be regarded as the normally developed integumentary tapetum. It may be considered that the polypetalous families containing tenuinucellate ovules with integumentary tapetum are showing a tendency towards evolution of gamopetalous families.

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